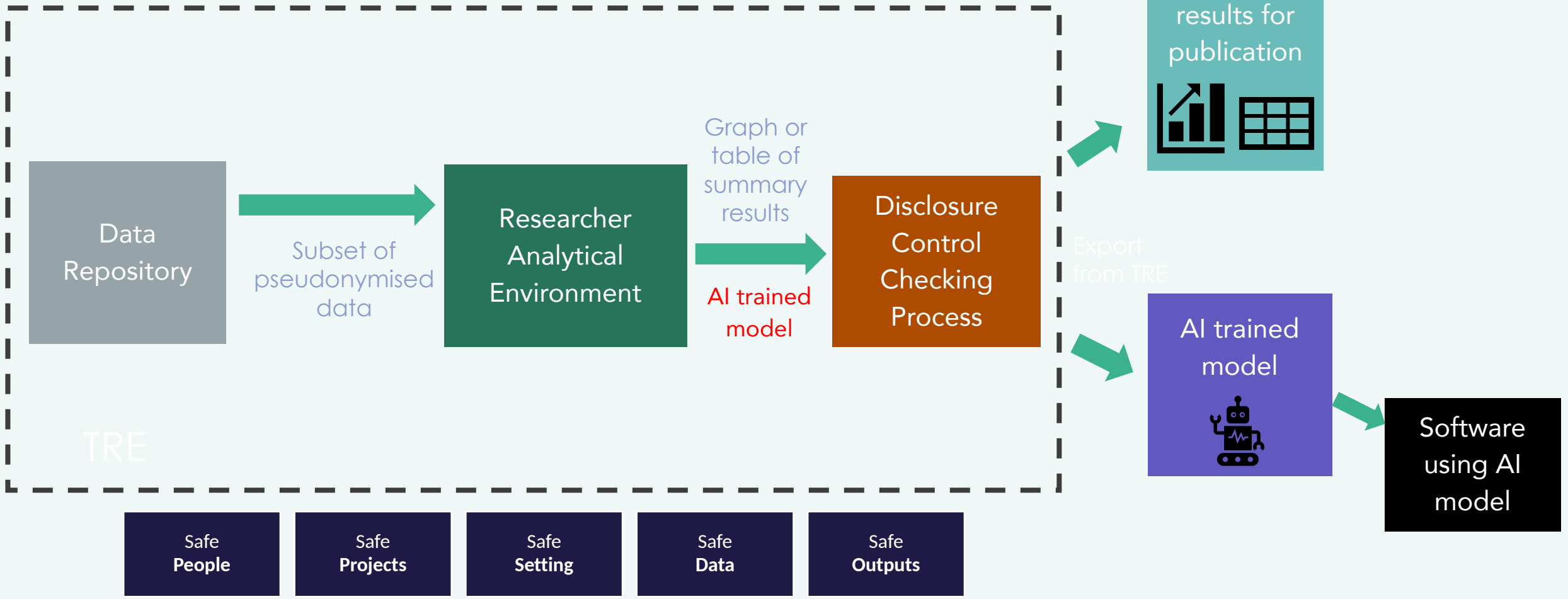
SACRO: Semi-Automated Checking of Research Outputs

Professor Jim Smith,

University of the West of England



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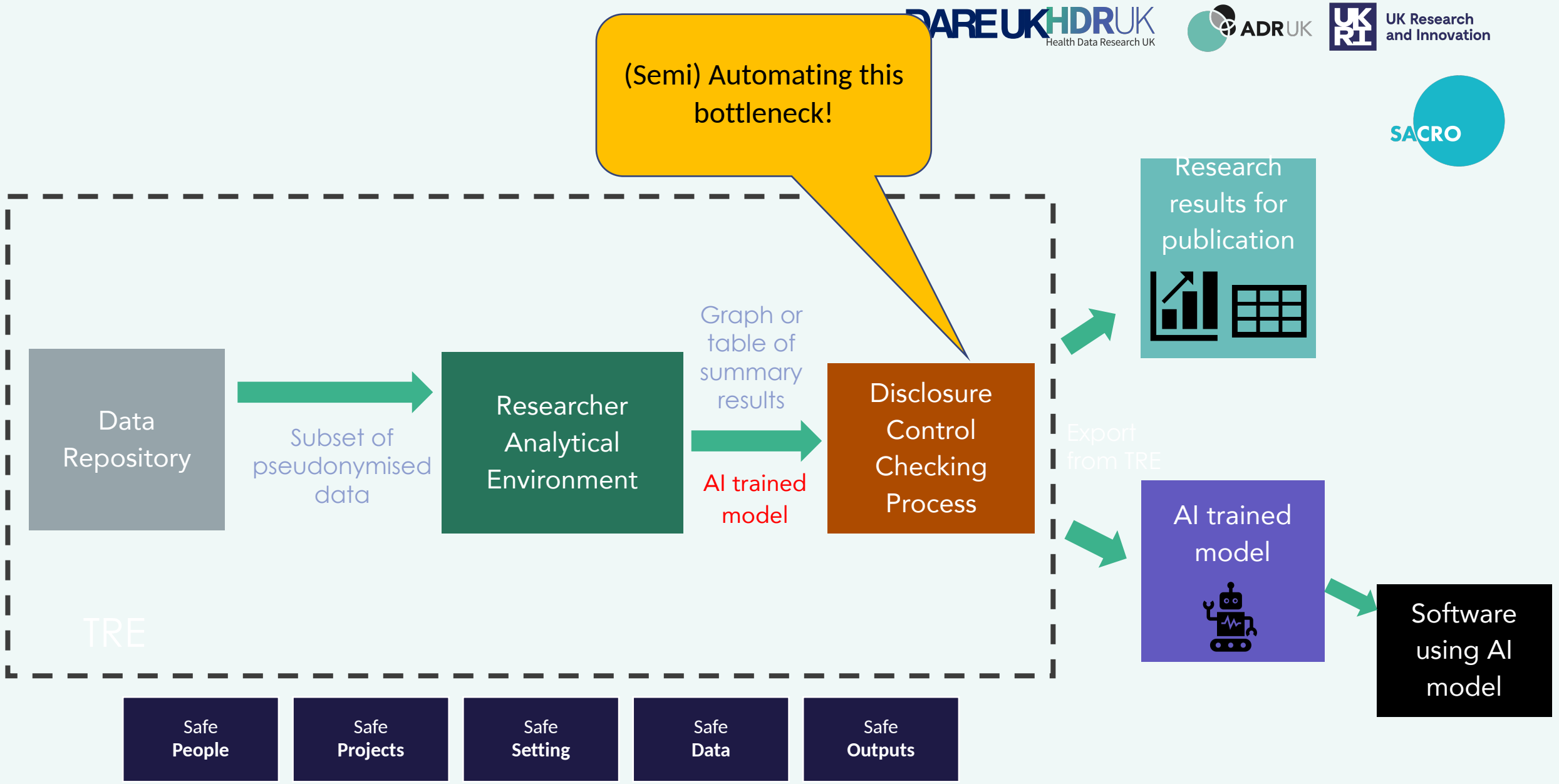

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Who are we? (alphabetically)

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- Dundee
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- DASH (Aberdeen/Grampian)
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External steering group:

UK: Office for National Statistics, ESRC, DARE
Global: Eurostat, SDC-GESIS, ICPSR (US)

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The current situation

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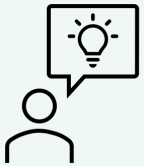

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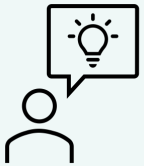

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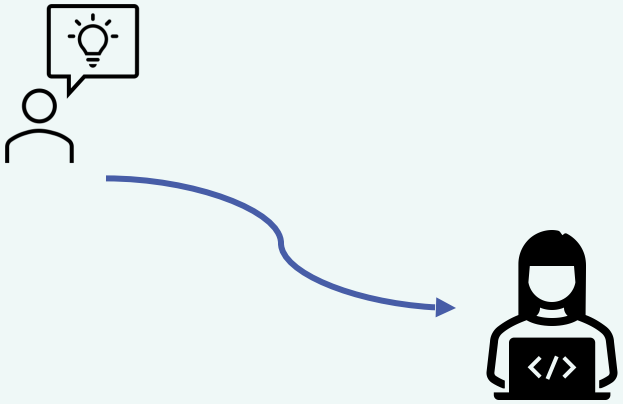

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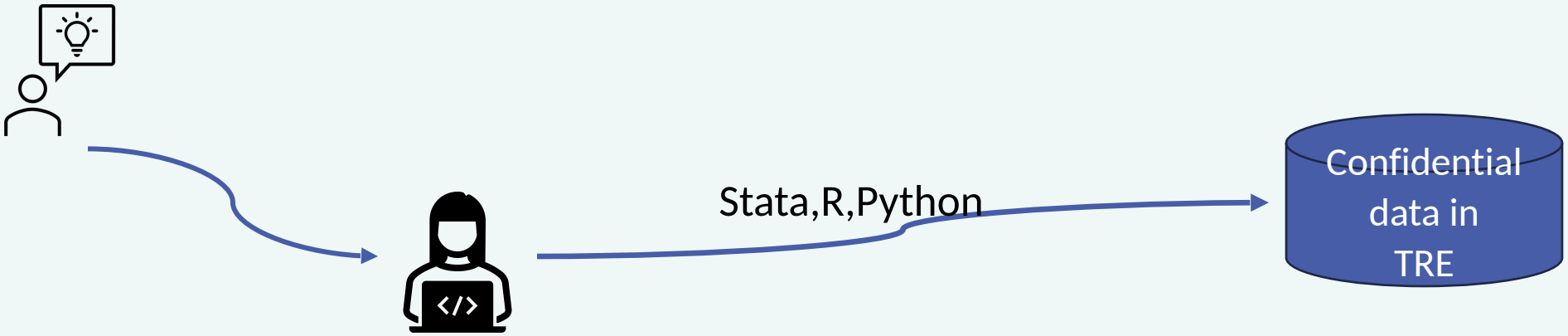

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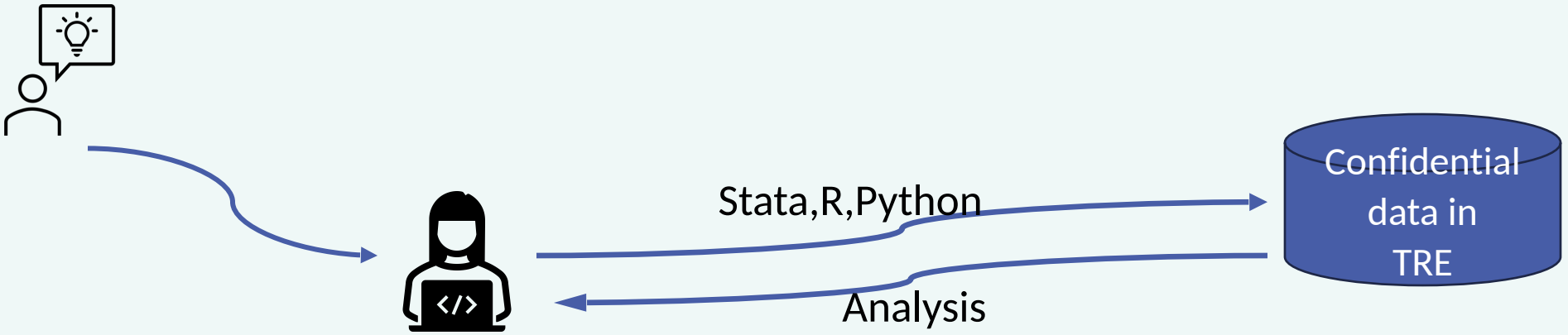

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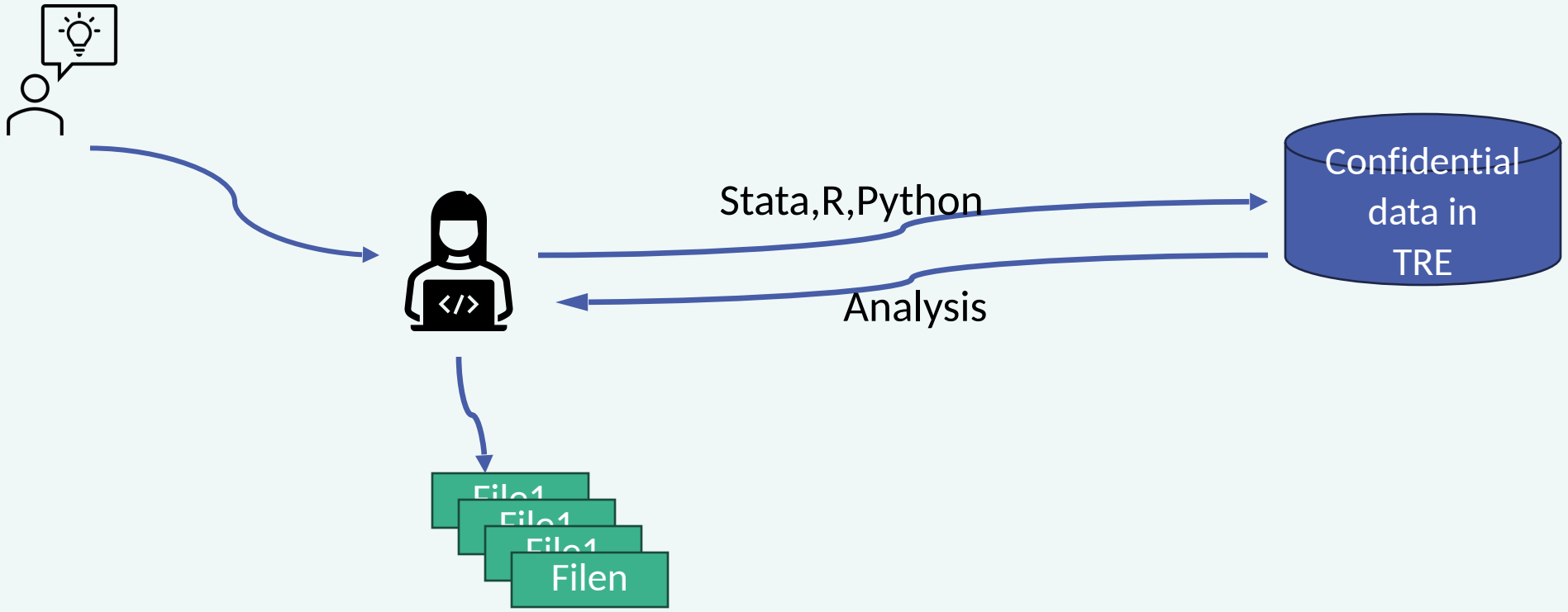

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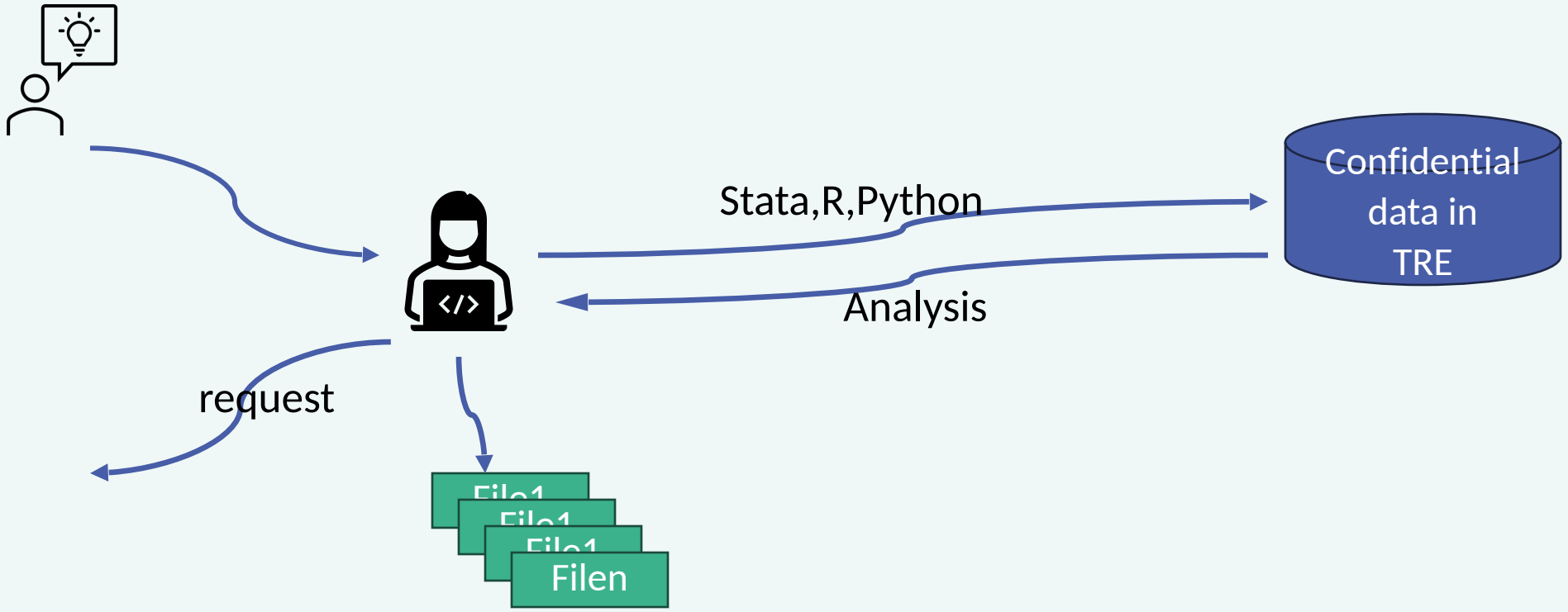

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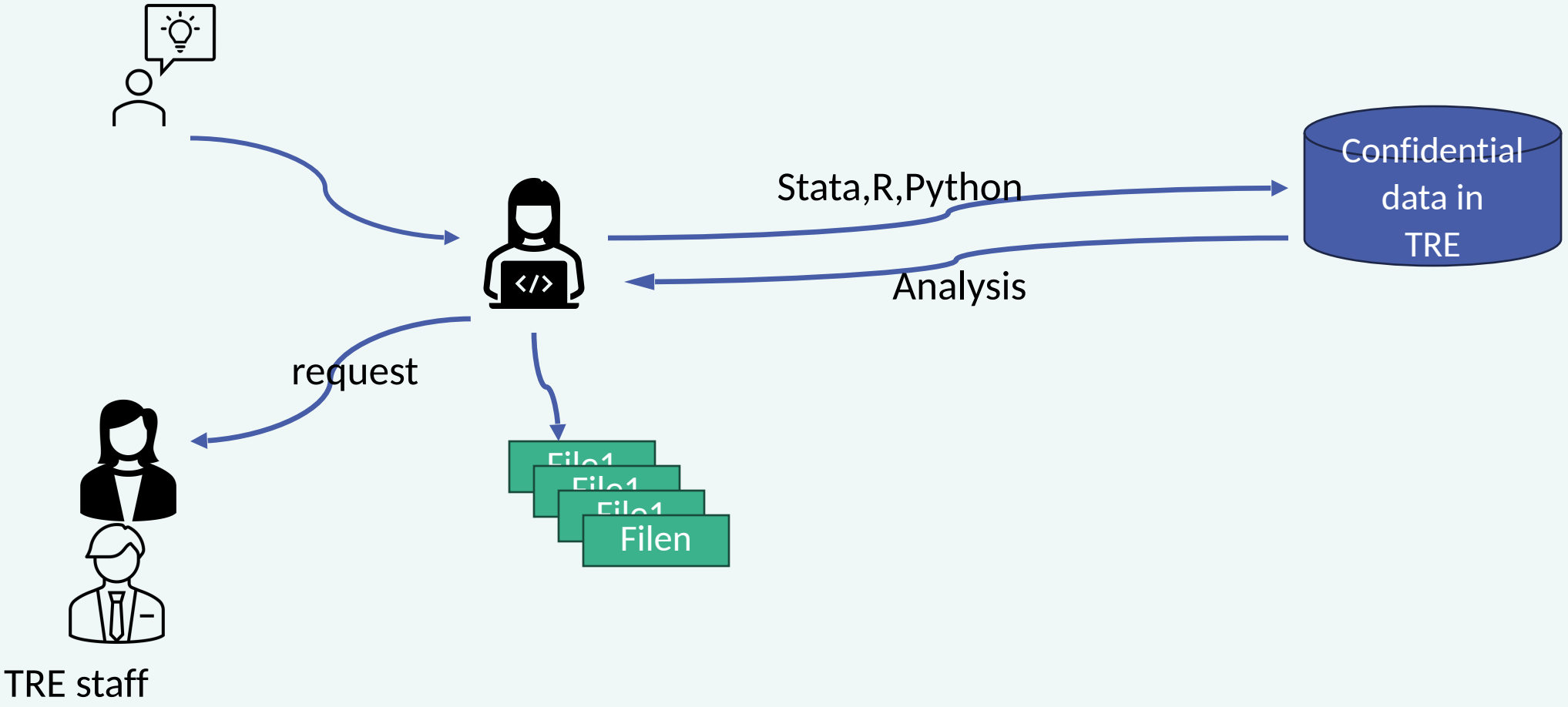

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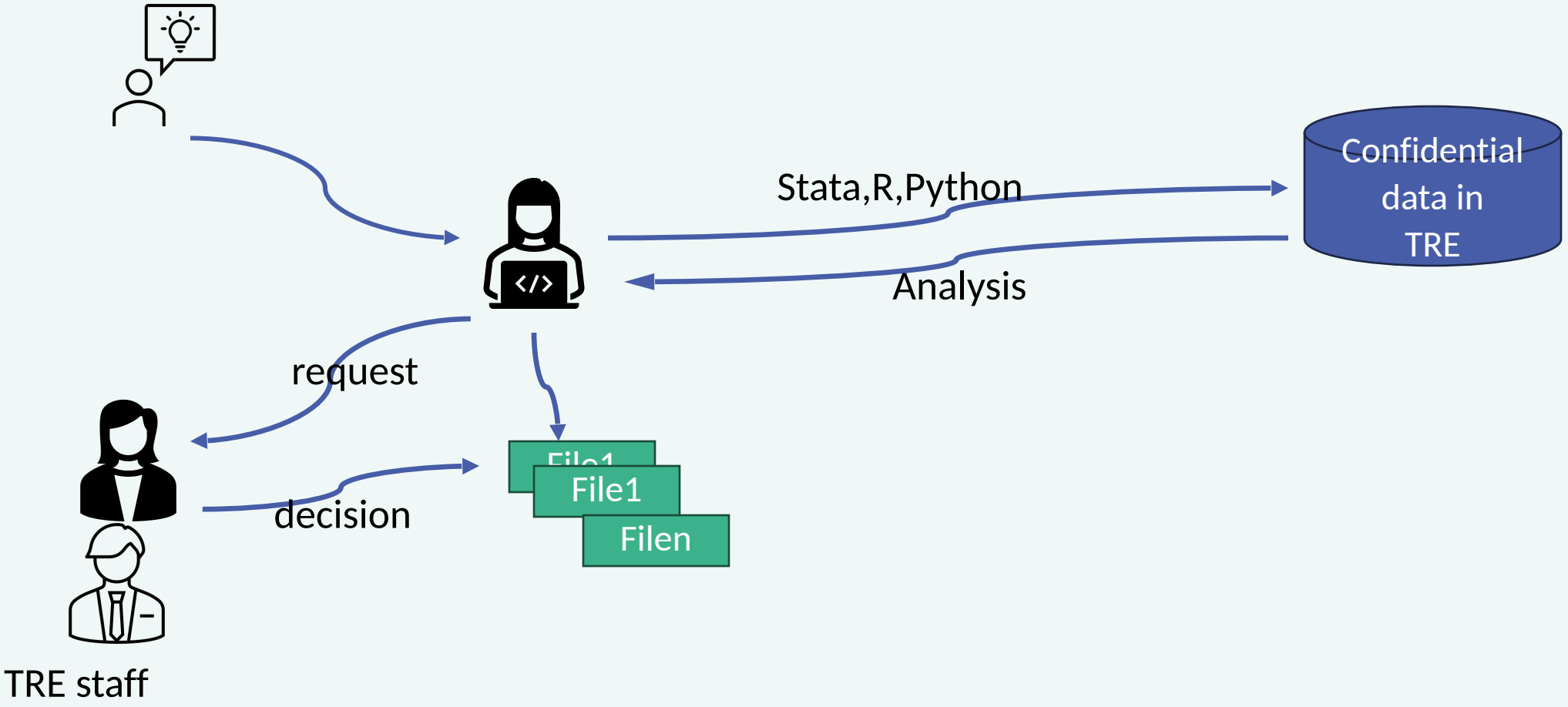

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SACRO in a nutshell

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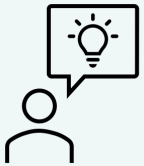

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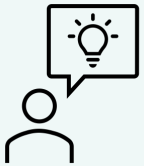

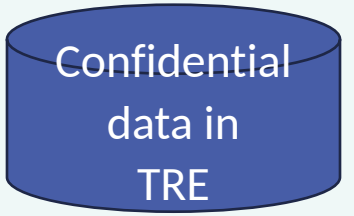

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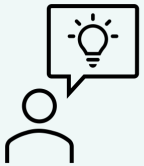

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TRE risk appetite

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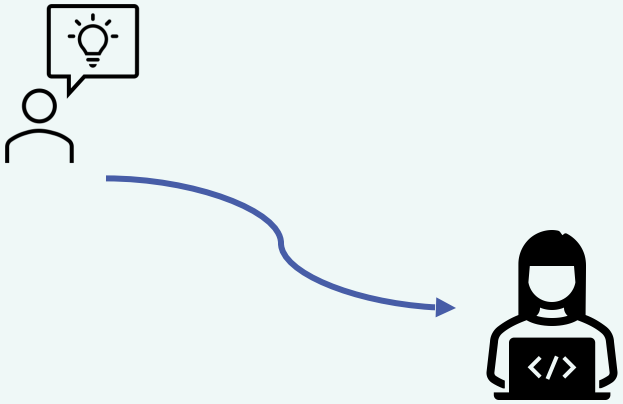

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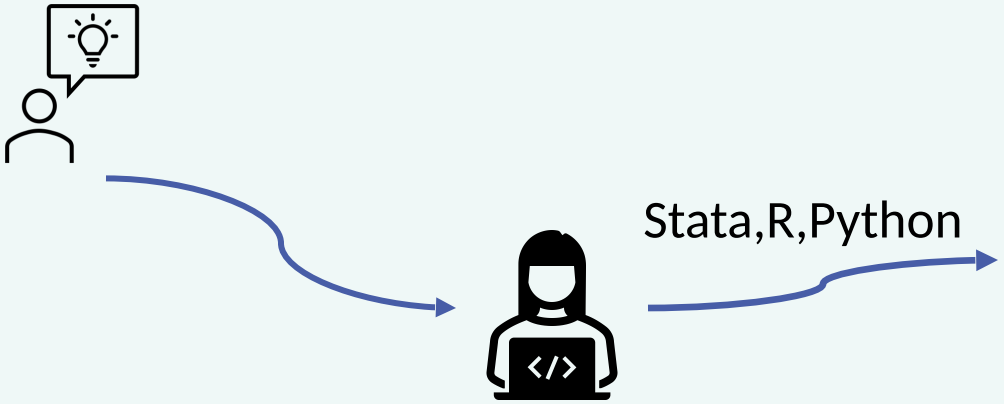

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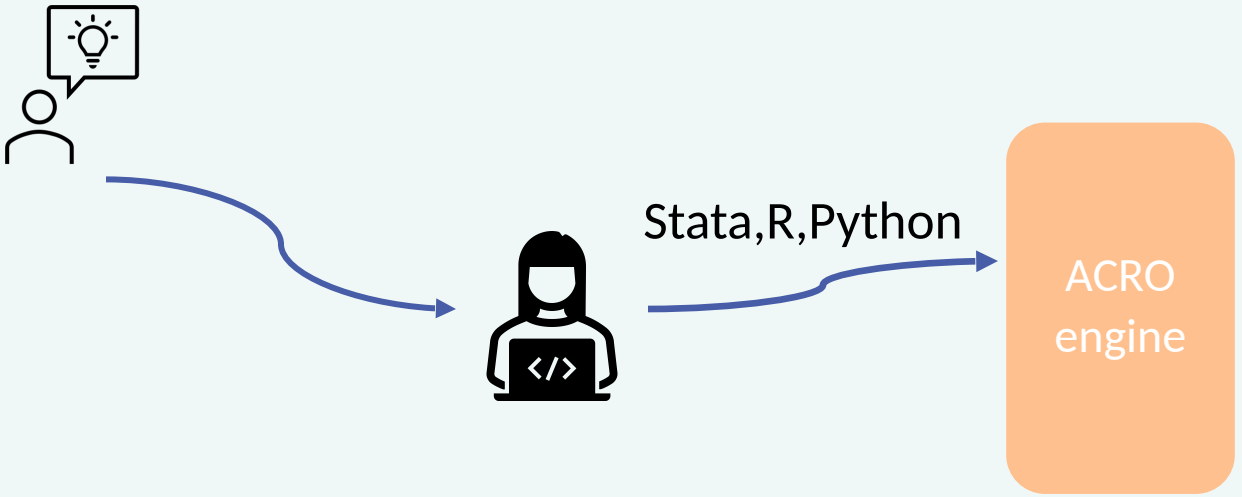

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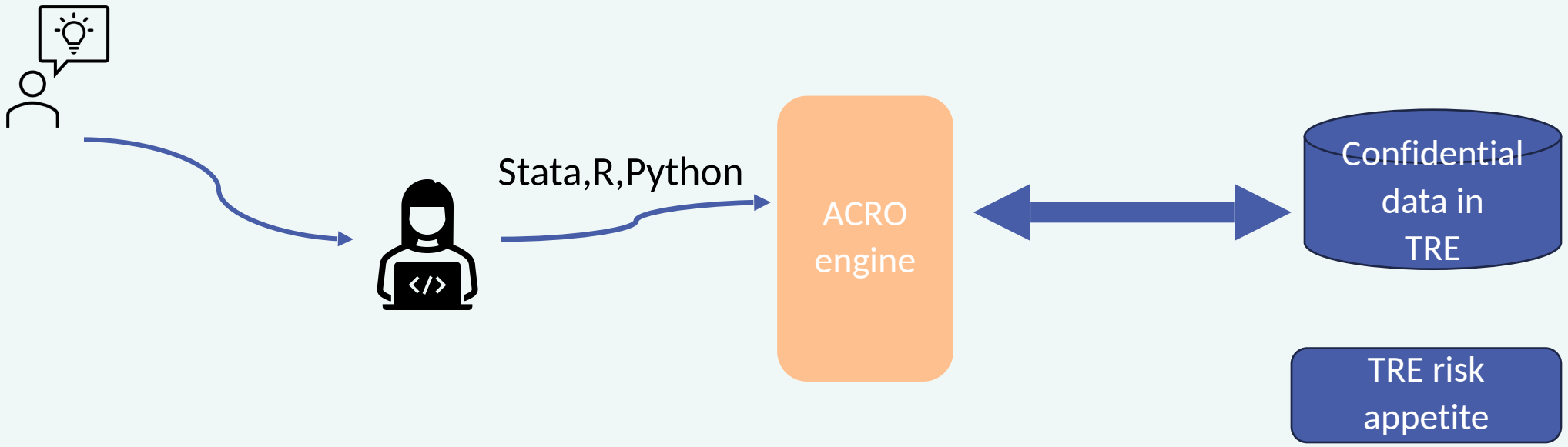

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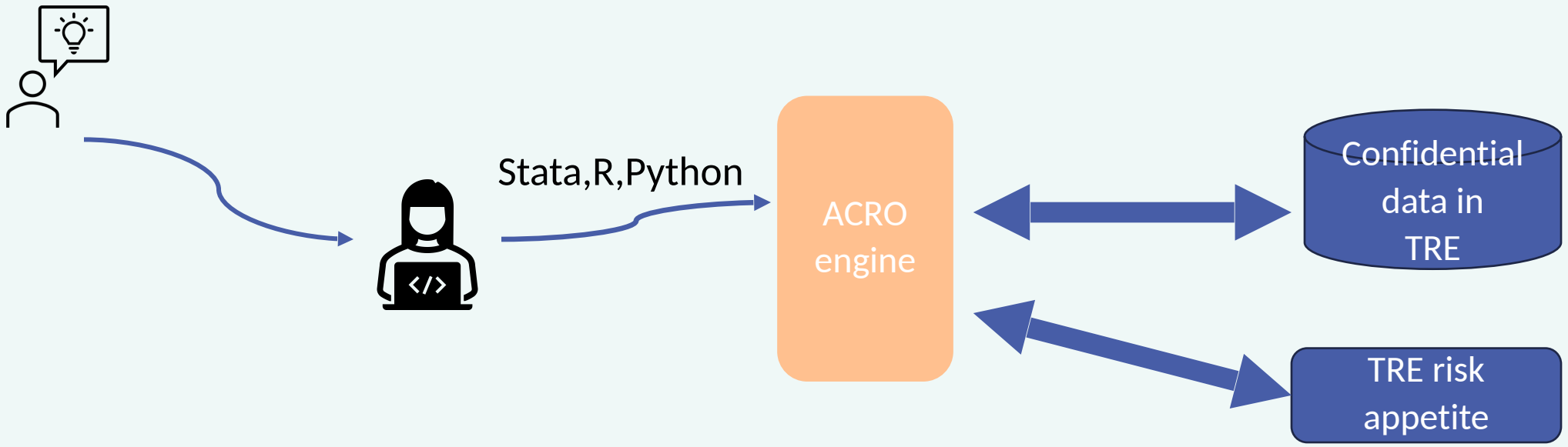

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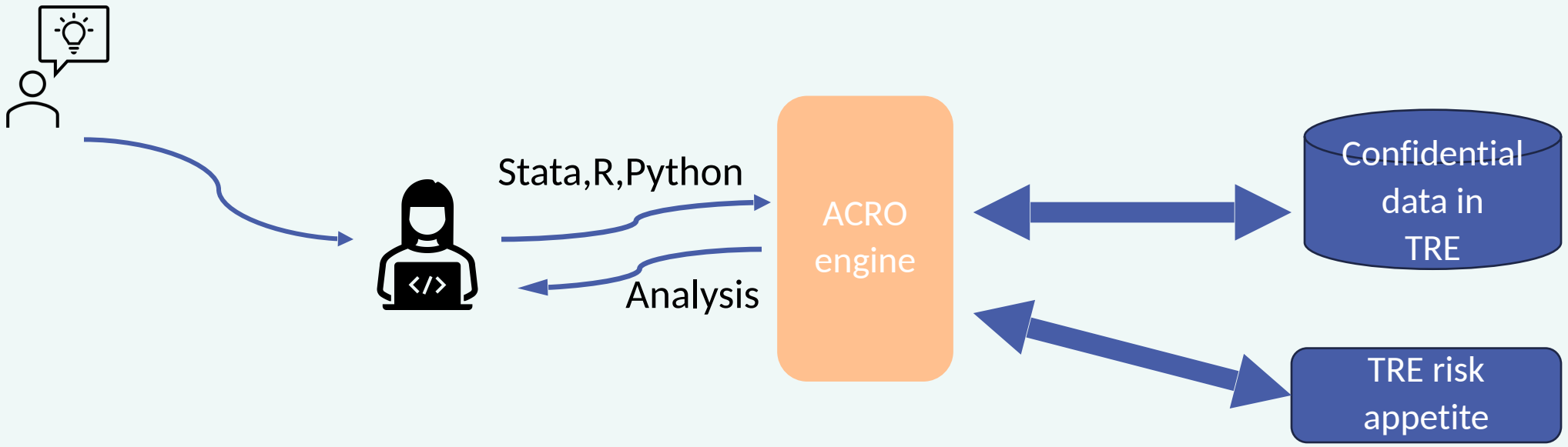

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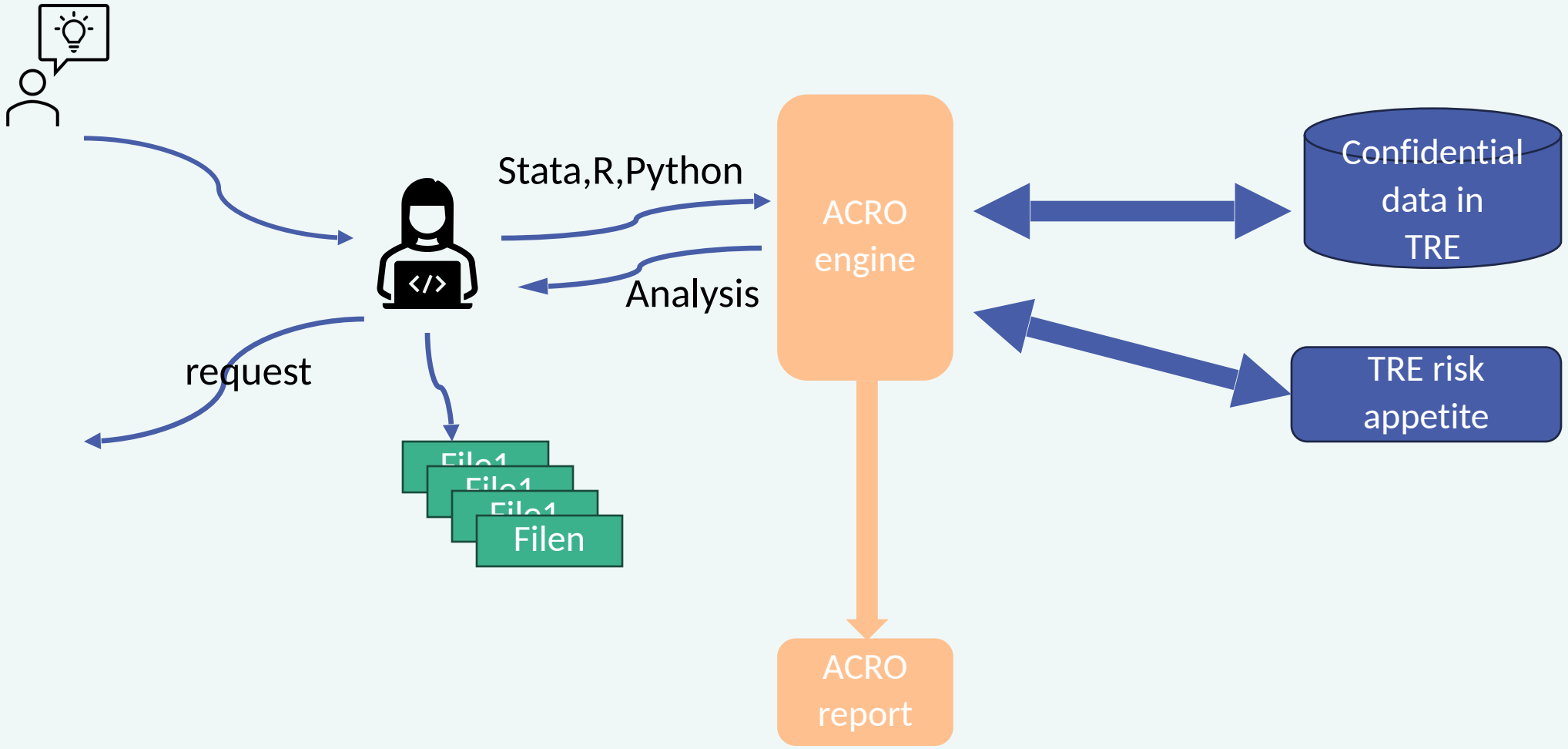

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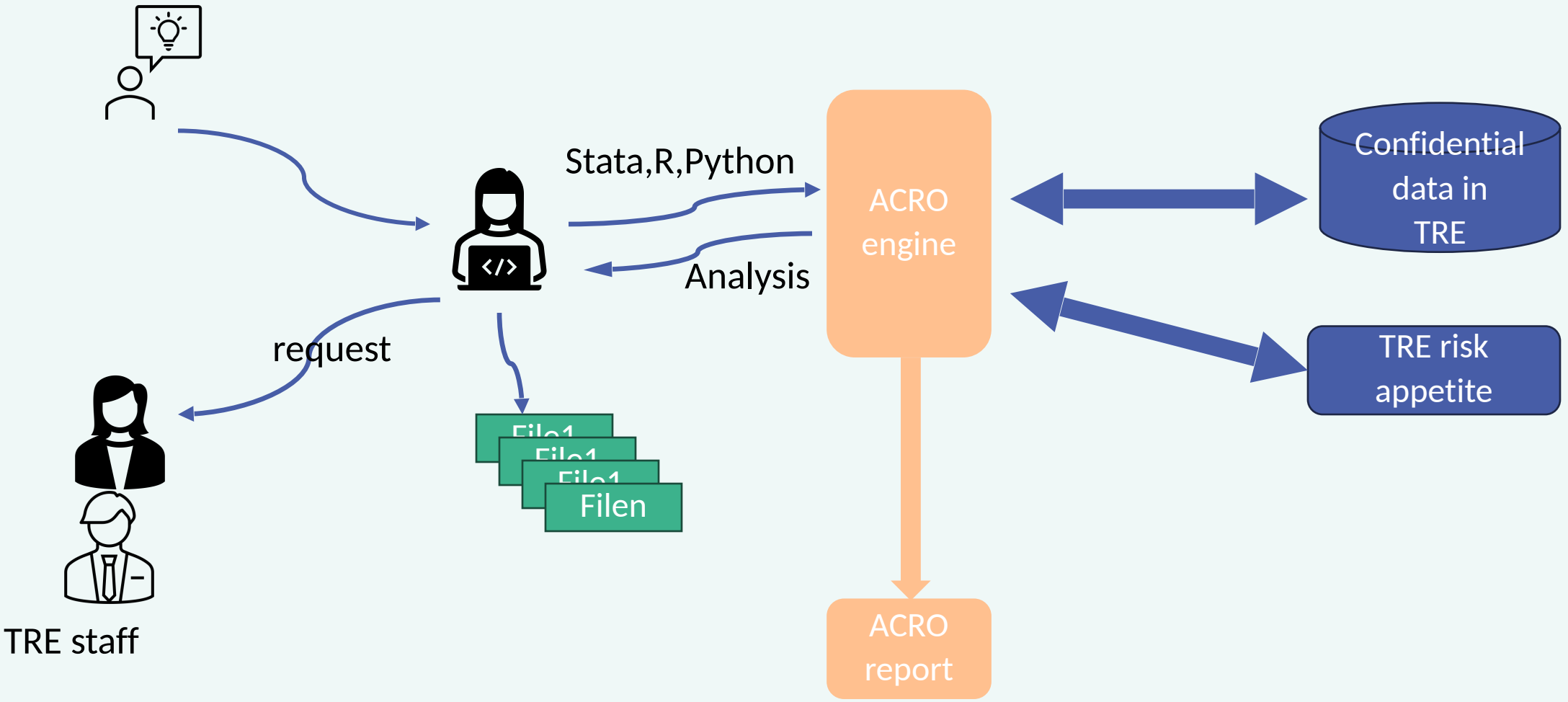

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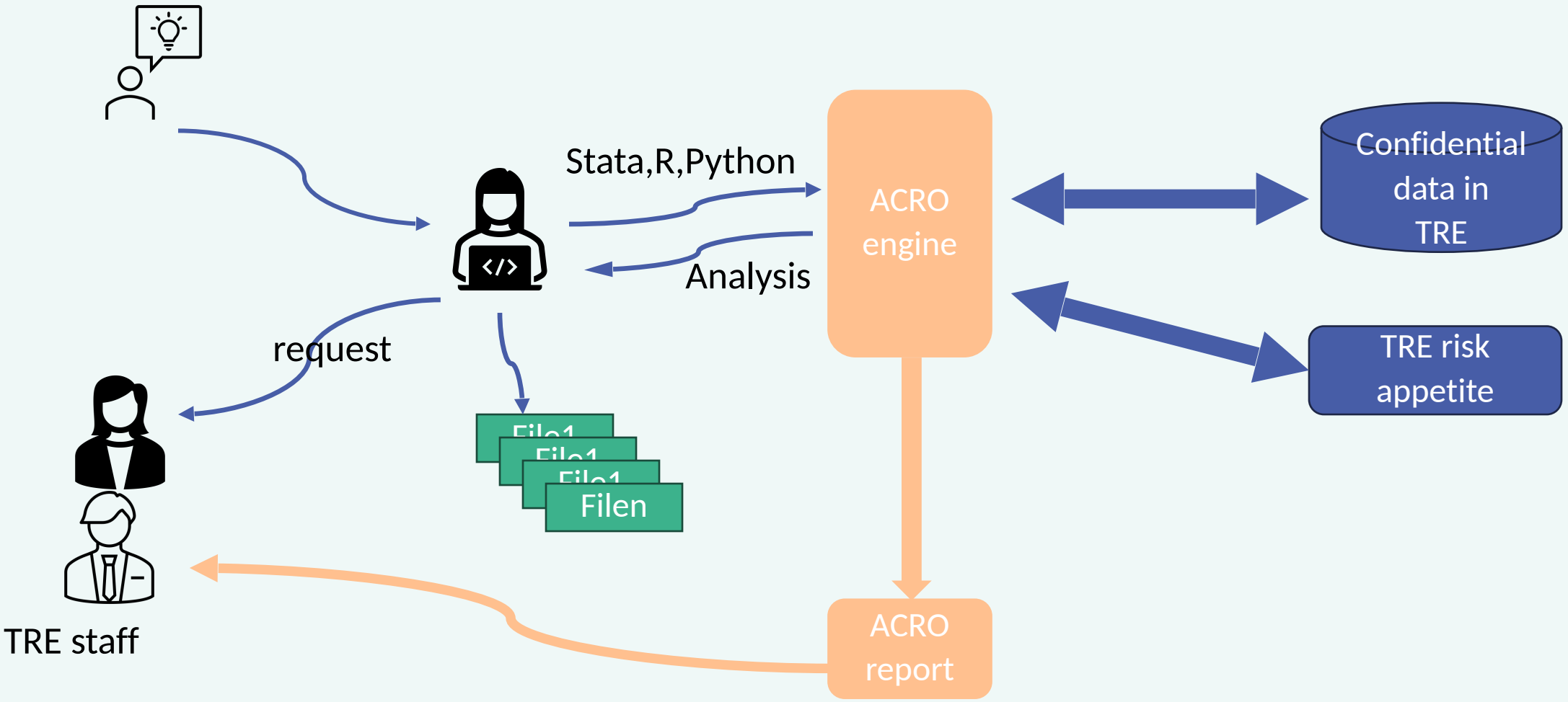

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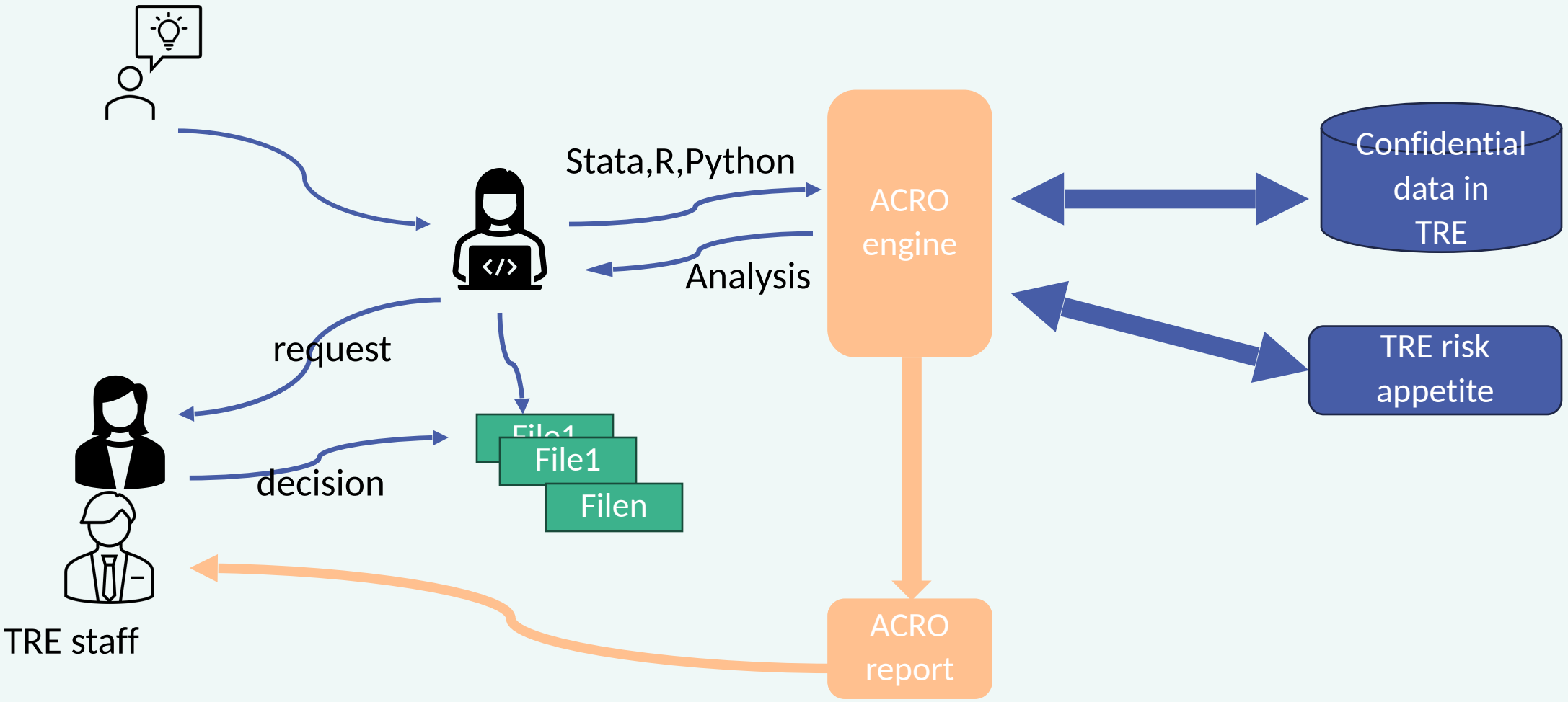

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Similar for Machine Learning Models

Except that we :

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Similar for Machine Learning Models

Except that we :

- Run a range of “inference” attacks”
- Aim to support more ‘user journeys’
- Don’t have a set of ‘tried and trusted’ guidelines to work with

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ACRO: analytic commands

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Using the same api as pandas, adding checks for cell count and dominance

- **acro.crosstab()**
- **acro.pivot_table**()

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- Also support R’s built in ‘**table**’ command
- Stata versions prefixed by “acro ”
  - Code currently captures and translates commands: **table, regress, probit, logit**

ACRO: user commands for session management

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- acro.add_comment(key, text)
- acro.custom_output(filename, description)

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- acro.add_exception(key, text)
- acro.add_comment(key, text)
- acro.custom_output(filename, description)
- acro.finalise(output_directory,format)

Example: what happens if researcher requests a disclosive table

```
acro.suppress = False

safe_table = acro.crosstab(df.recommend, df.parents)
print(safe_table)
```

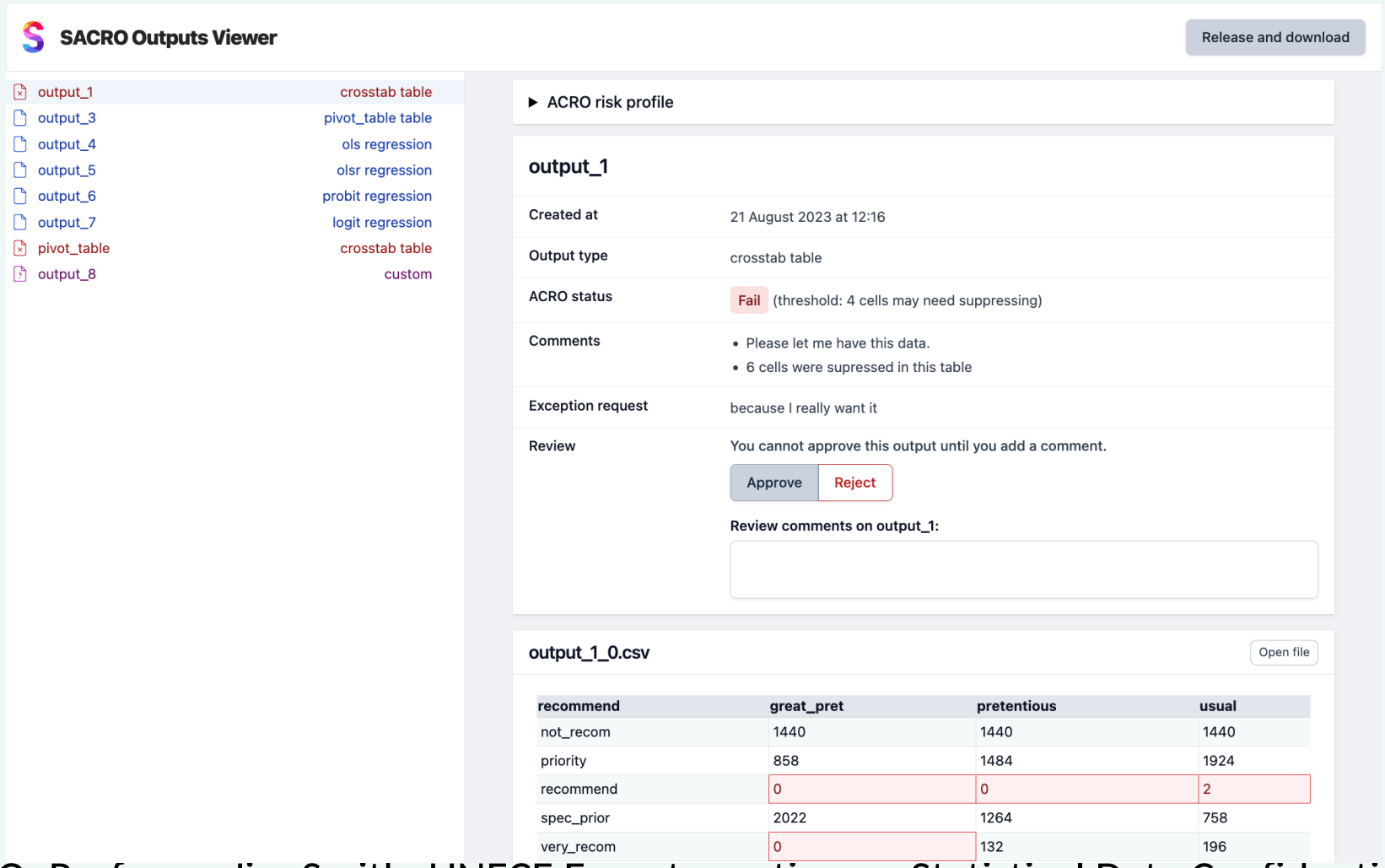
```
INFO:acro:get_summary(): fail; threshold: 4 cells may need suppressing;
INFO:acro:outcome_df:
-------------------------------------------------|
parents     |great_pret    |pretentious   |usual       |
recommend   |              |              |            |
-------------------------------------------------|
not_recom   |           ok |           ok |          ok|
priority    |           ok |           ok |          ok|
recommend   | threshold;   | threshold;   | threshold; |
spec_prior  |           ok |           ok |          ok|
very_recom  | threshold;   |           ok |          ok|
-------------------------------------------------|

INFO:acro:records:add(): output_1
```

parents	great_pret	pretentious	usual
recommend			
not_recom	1440	1440	1440
priority	858	1484	1924
recommend	0	0	2
spec_prior	2022	1264	758
very_recom	0	132	196

23

SACRO viewer for TRE output checkers



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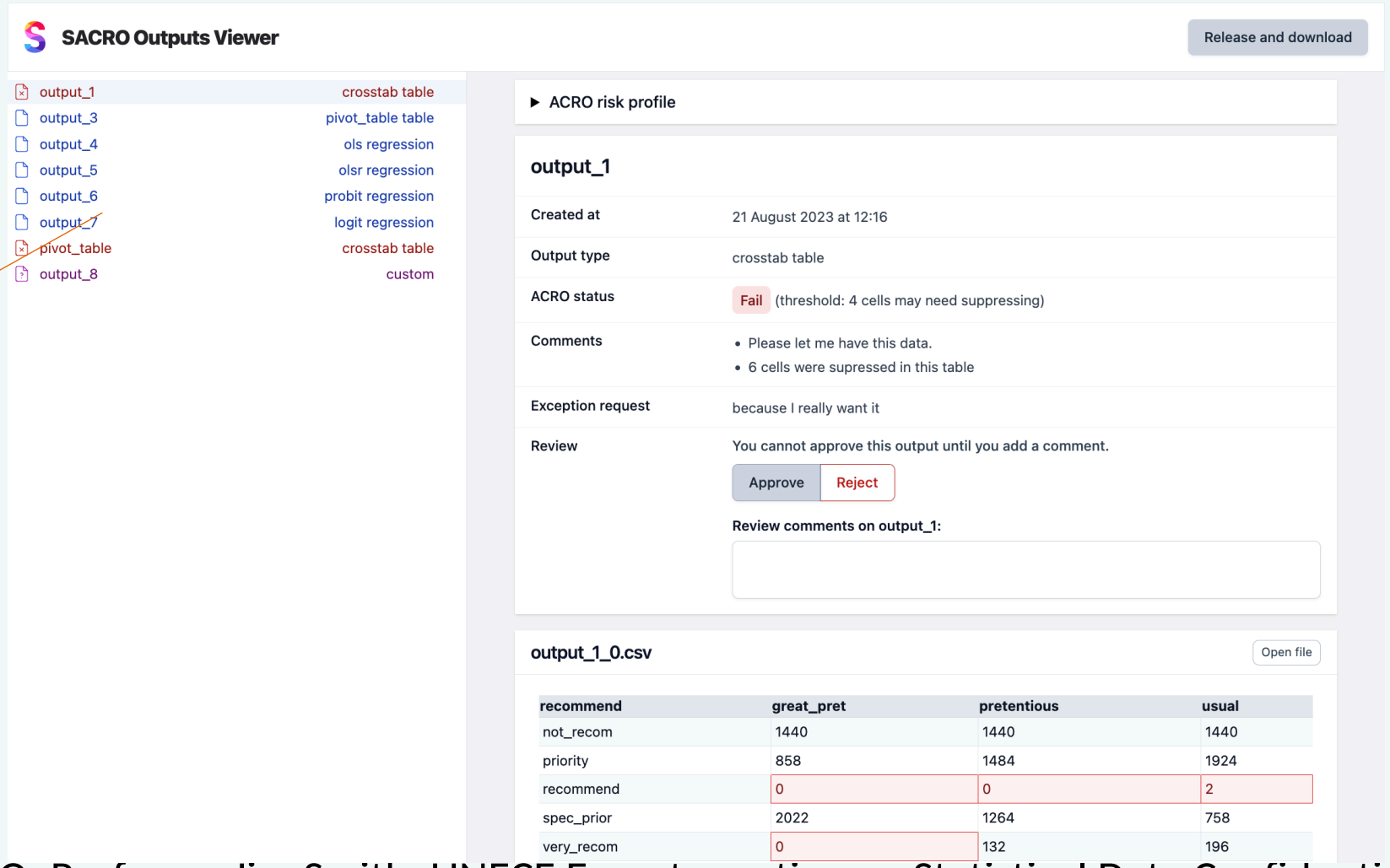
SACRO viewer for TRE output checkers

Outputs to review



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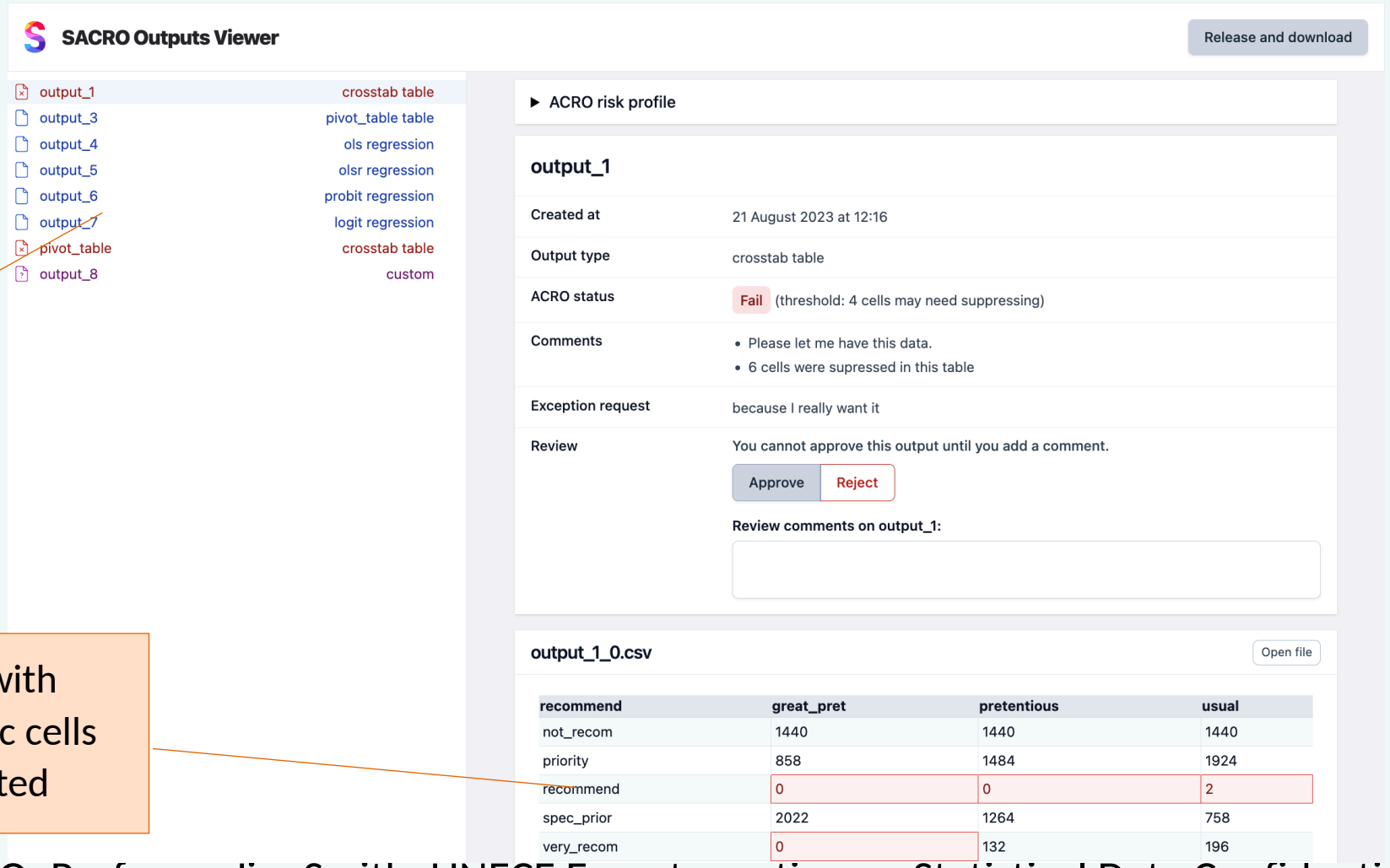
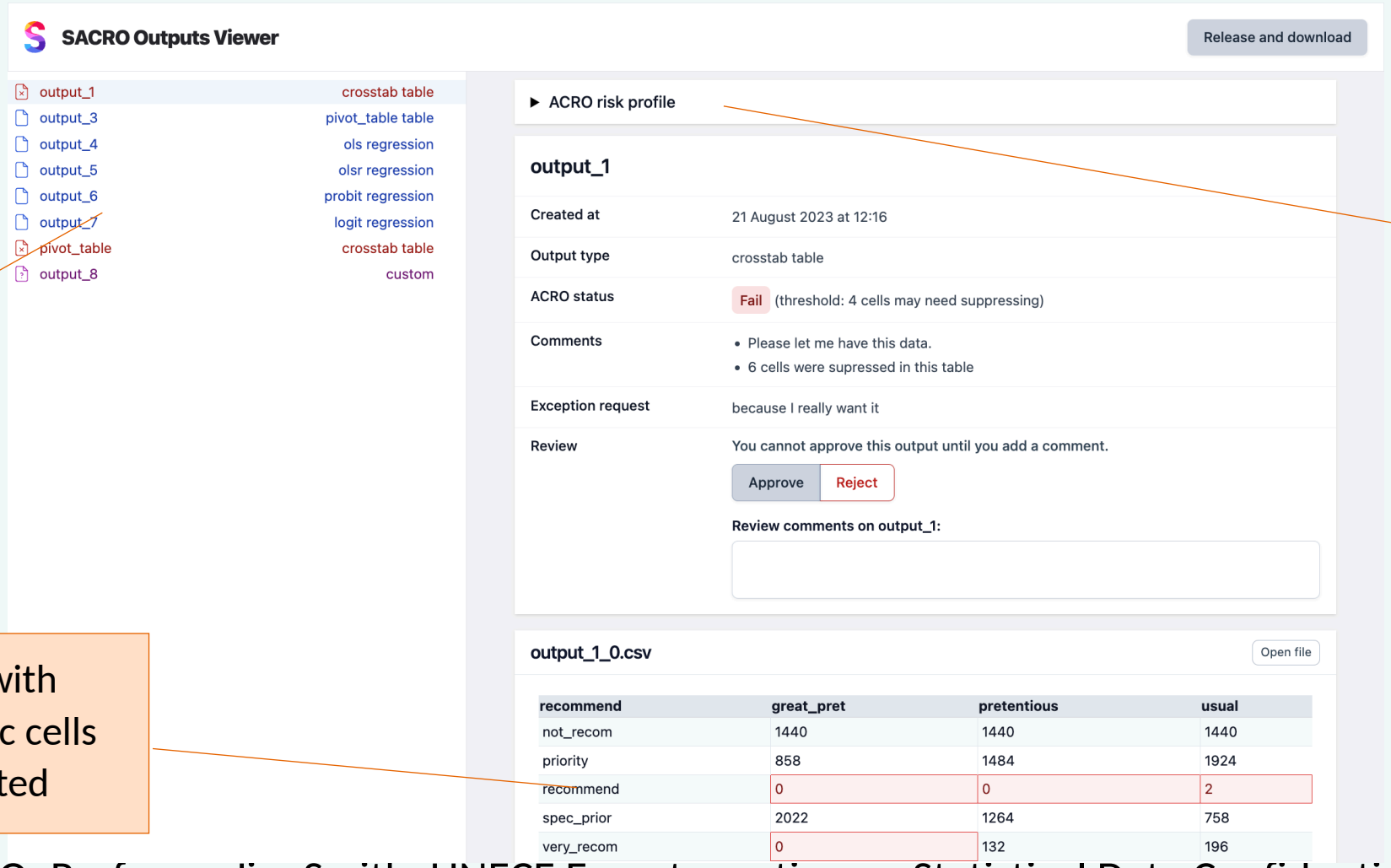


Outputs to review

Output with problematic cells highlighted

SACRO viewer for TRE output checkers



Outputs to review

view TRE risk appetite

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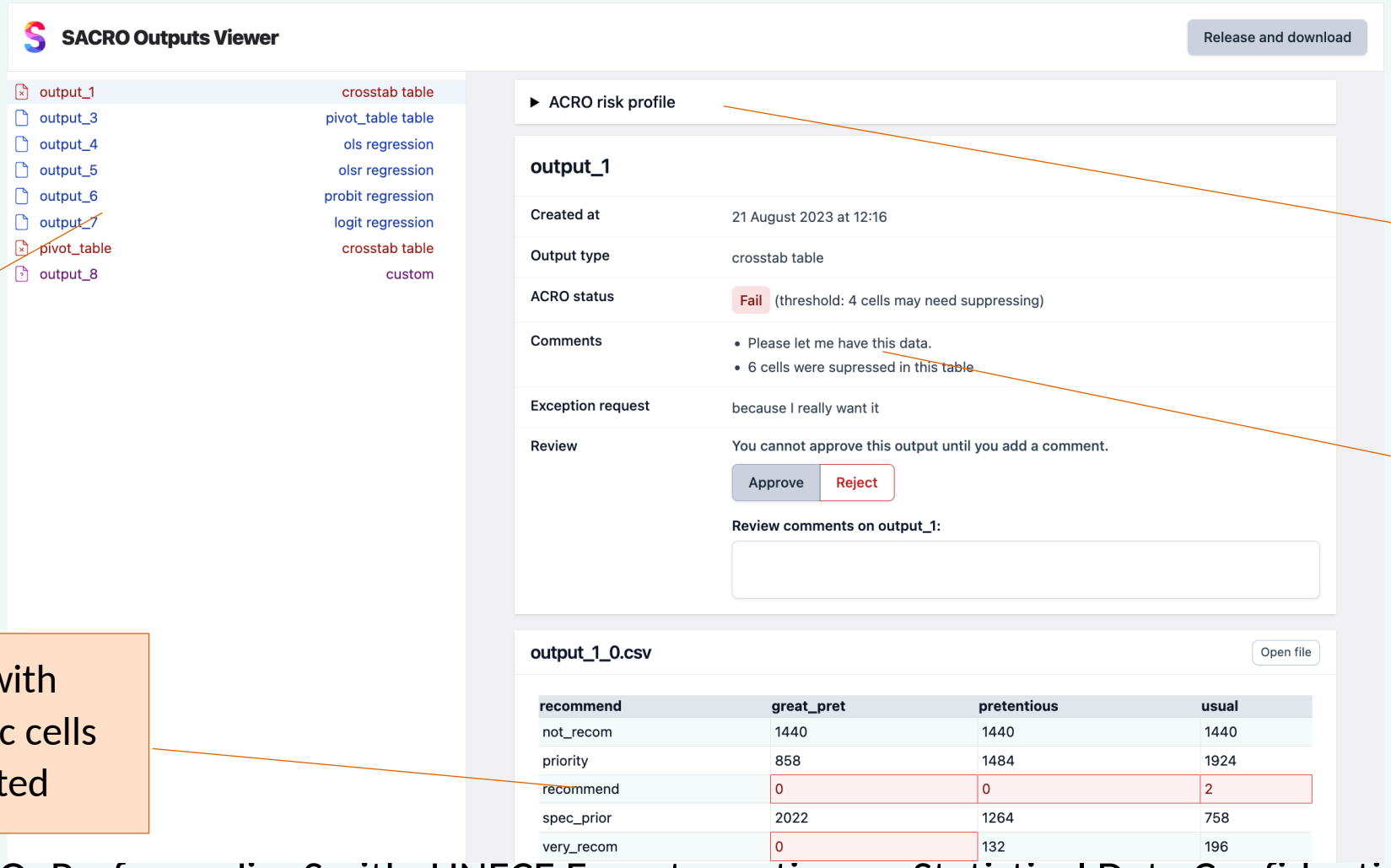

Outputs to review

view TRE risk appetite

Type of output
Recommendation
Comments from user
Exception. request

Output with problematic cells highlighted

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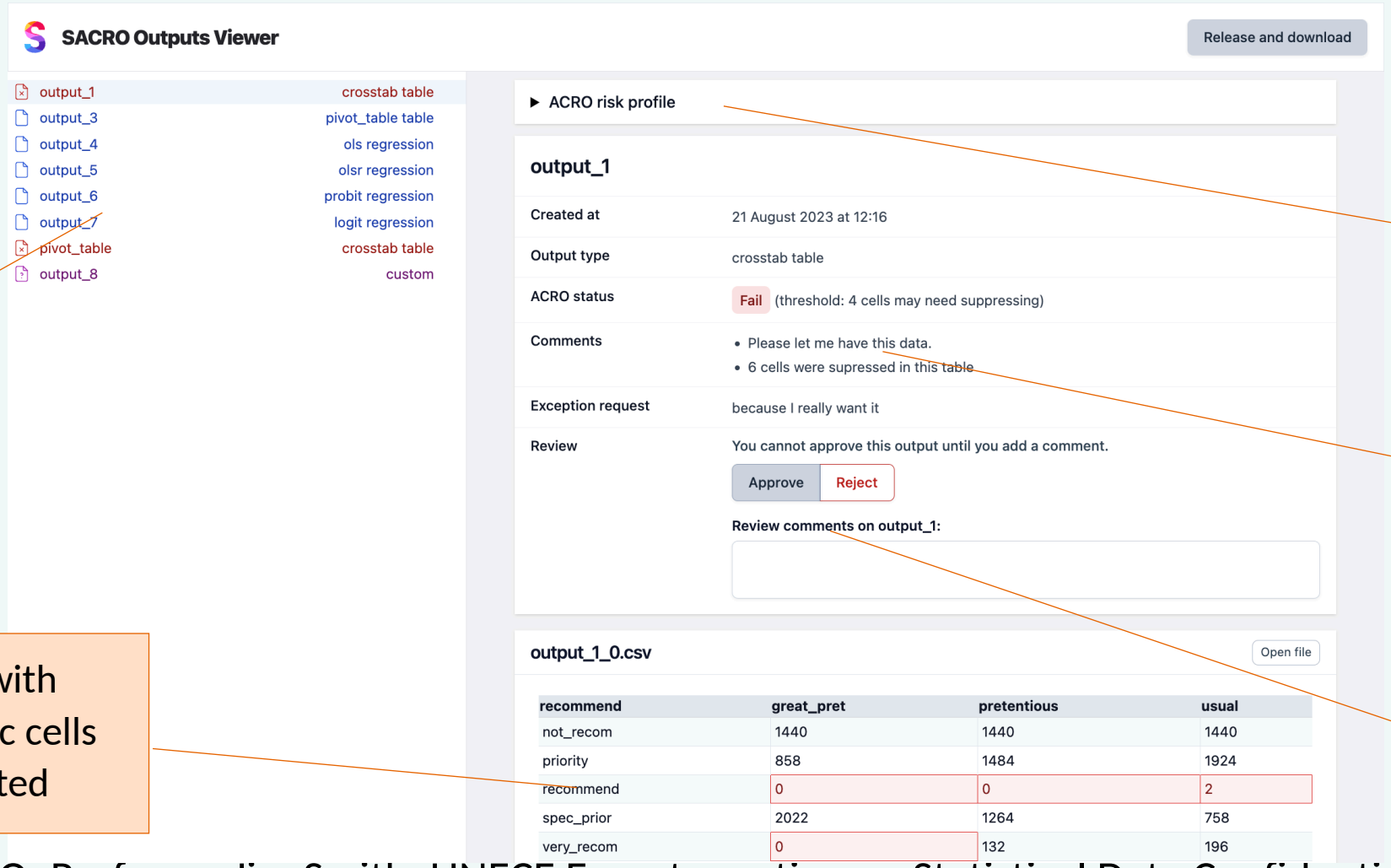

Outputs to review

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Comments needed to override recommendation

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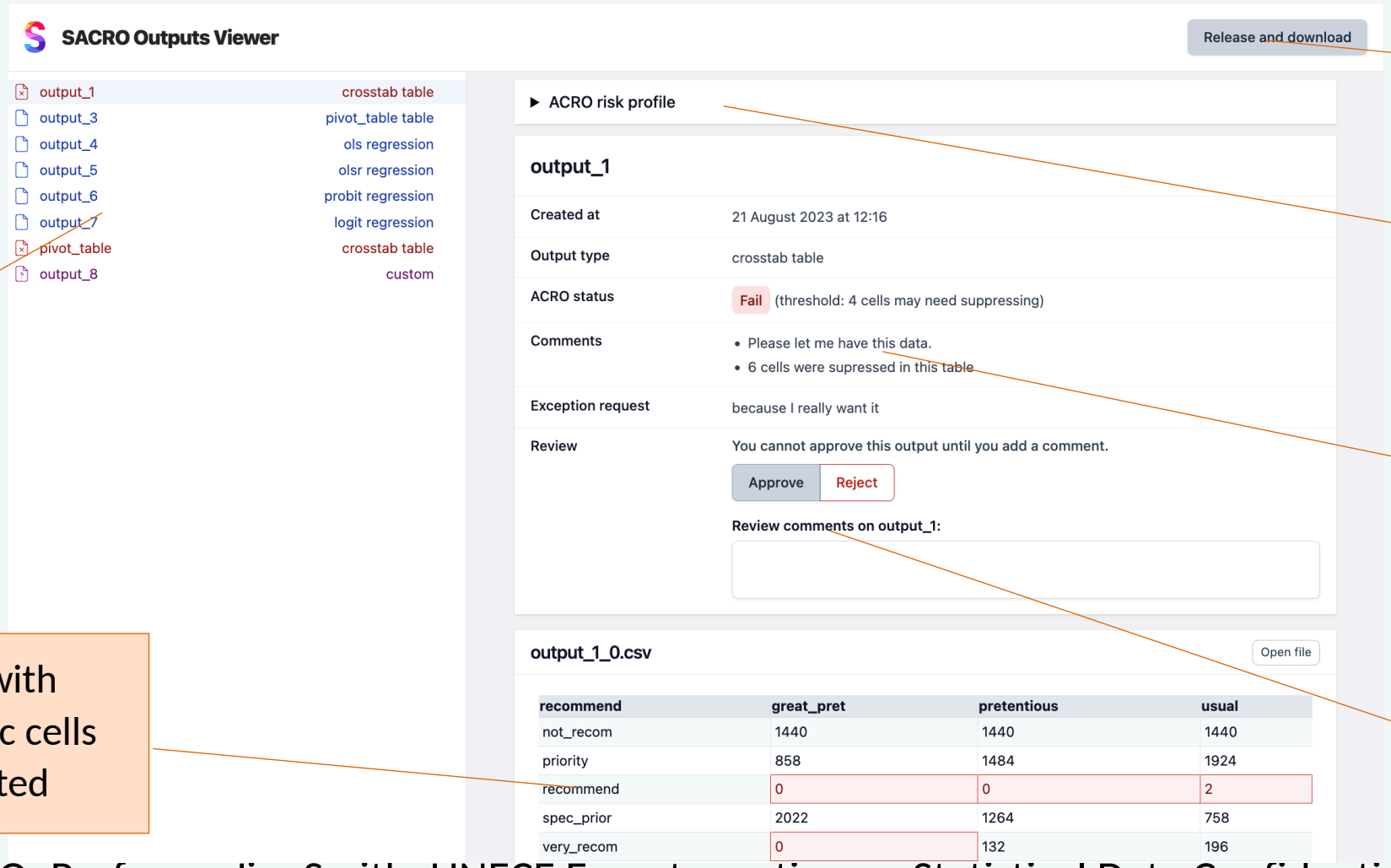

Outputs to review

Record overall comments, create release package

view TRE risk appetite

Type of output
Recommendation
Comments from user
Exception. request

Output with problematic cells highlighted

Comments needed to override recommendation

Get Involved

Get involved

Thanks to:

SACRO: Professor Jim Smith, UNECE Expert meeting on Statistical Data Confidentiality 2023

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Viewer:

- https://github.com/opensafely-core/sacro

Consensus statement: sacro.contact@uwe.ac.uk

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